

AMENDMENTS TO THE CLAIMS

1. (AMENDED) An apparatus for introducing a biological material into a host which comprises:

one or more packing units for containing a mixture solution containing a pool which comprises a plurality of a large number of magnetic supports carrying a biological material to be introduced into a host such as cells and having a size allowing entry into said host, and a plurality of a large number of said hosts;

an introduction treatment unit which controls a magnetic force affecting the inside of said packing unit from at least two directions with said packing unit therebetween so as to move said magnetic supports relatively with respect to said hosts in solution to introduce said biological material into said hosts,

wherein said introduction treatment unit moves said magnetic supports and said host relative to each other in a state where the plurality of large number of said magnetic supports in the solution contained in said packing unit are developed in solution by the magnetic force, in a planar form, and controls so as to move said magnetic supports in the normal direction of the developed surface,

wherein said introduction treatment unit has: a magnetic source which can apply a magnetic force to the inside of said packing unit; and a magnetic force control unit which controls said magnetic supports to move relatively with respect to said host, by changing the relative position or the velocity between said packing unit or said mixture solution and said magnetic source, or the magnetic force itself due to said magnetic source,

wherein said packing unit has a liquid passage through which said mixture solution can pass, and has a pressure adjuster which draws and discharges the solution by adjusting the pressure in said liquid passage, as said magnetic force control unit,

2 - 3 (CANCELLED).

4. (PREVIOUSLY PRESENTED) An apparatus for introducing a biological material according to claim 1, wherein said magnetic support is a particle having a major axis and a size allowing entry into said host along a major axis direction.

5. (PREVIOUSLY PRESENTED) An apparatus for introducing a biological material according to claim 1 or claim 2, wherein an introduction adjuvant for helping to introduce a biological material into said host is contained in said packing unit together with said biological material.

6. (PREVIOUSLY PRESENTED) An apparatus for introducing a biological material according to claim 5, wherein said magnetic support has a carrier for carrying said biological material.

7. (PREVIOUSLY PRESENTED) An apparatus for introducing a biological material according to claim 4, wherein in said magnetic support, both ends or one end along said major axis are formed in a tapered shape.

8. (PREVIOUSLY PRESENTED) An apparatus for introducing a biological material according to claim 7, wherein said introduction treatment unit performs introduction treatment based on the properties, the amount, or the density of said host, said biological material, or said magnetic support.

9. (CANCELLED).

10. (PREVIOUSLY PRESENTED) An apparatus for introducing a biological material according to any one of claim 1, provided with a transfer mechanism which enables relative movement between said packing unit and the position of the introduction treatment where said introduction treatment unit can perform the introduction treatment with respect to said packing unit.

11. (PREVIOUSLY PRESENTED) An apparatus for introducing a biological material according to any one of claim 1, wherein said magnetic source comprises a plurality of electromagnets provided around said packing unit, and said magnetic force control unit electrically modifies the magnitude of the magnetic force of said electromagnets.

12. (PREVIOUSLY PRESENTED) An apparatus for introducing a biological material according to any one of claim 1, having a plurality of permanent magnet blocks or electromagnets serving as said magnetic source which are movably provided around said packing unit, and said magnetic force control unit moves said magnetic sources with respect to said packing unit.

13. (PREVIOUSLY PRESENTED) An apparatus for introducing a biological material according to any one of claim 1, wherein said magnetic source is an annular magnet having predetermined magnetic poles which are arranged around said packing unit in a circular tubular shape, and said magnetic force control unit has: a magnetic source transfer unit which enables movement of said magnetic source along the radial direction, axial direction, and the circumferential direction of said packing unit; or a packing unit transfer unit which enables movement of said packing unit; or a mixture solution transfer unit which moves the mixture solution.

14. (PREVIOUSLY PRESENTED) An apparatus for introducing a biological material according to claim 1, wherein a plurality of said packing units are arranged along a horizontal line, and said introduction treatment unit has: two linear magnetic sources provided with said packing unit therebetween, along said horizontal line, and having magnetic poles provided respectively in positions corresponding to the respective packing units; and a magnetic force control unit which enables relative movement between said magnetic supports and said host by changing the relative position between said packing unit or said mixture solution and said linear magnetic sources, or changing the magnetic force itself due to said linear magnetic sources.

15. (PREVIOUSLY PRESENTED) An apparatus for introducing a biological material according to claim 14, wherein said linear magnetic source has two linear support bodies provided on

opposite sides with said arrayed packing units therebetween, along said horizontal line, and a plurality of permanent magnets or electromagnets arranged at intervals and positions corresponding to the respective packing units, in said linear support bodies.

16. (PREVIOUSLY PRESENTED) An apparatus for introducing a biological material according to claim 14 or claim 15, wherein each of said packing units has a liquid passage through which a mixture solution can pass, and a pressure adjuster which draws and discharges the solution by adjusting the pressure in the liquid passage.

17. (PREVIOUSLY PRESENTED) An apparatus for introducing a biological material according to claim 1, wherein said introduction treatment unit has a magnetic separation unit whereby hosts having said magnetic support introduced thereinto or adhered thereto, are attached to the inner wall of said packing unit and separated from the mixture solution in said packing unit, by controlling said magnetic force applied to the inside of said packing unit.

18. (PREVIOUSLY PRESENTED) An apparatus for introducing a biological material according to claim 17, wherein said magnetic separation unit has a separation instruction unit which instructs said magnetic force control unit to apply only a unidirectional magnetic force towards the wall of said packing unit.

31. (AMENDED) An apparatus for introducing a biological material into a host comprising;
one or more packing units for containing a mixture solution which comprises a plurality of a large number of magnetic supports carrying a biological material to be introduced into a host such as a cell and having a size allowing entry into said host, and a plurality of a large number of said hosts;

an introduction treatment unit which moves said magnetic supports relatively with respect to said hosts in the solution by controlling a magnetic force applied to inside said packing unit from at least two directions with said packing unit therebetween so as to introduce said biological material into said hosts; and

a perforation treatment unit which perforates said host,

wherein said introduction treatment unit moves said magnetic supports and said host relatively to each other in a state where a plurality of a large number of said magnetic supports in the solution contained in said packing unit are developed in solution by the magnetic force, in a planar form, and controls so as to move said magnetic supports in the normal direction of the developed surface,

wherein said introduction treatment unit has: a magnetic source which can apply a magnetic force to the inside of said packing unit; and a magnetic force control unit which controls said magnetic supports to move relatively with respect to said host, by changing the relative position or the velocity between said packing unit or said mixture solution and said magnetic source, or the magnetic force itself due to said magnetic source,

wherein said packing unit has a liquid passage through which said mixture solution can pass, and has a pressure adjuster which draws and discharges the solution by adjusting the pressure in said liquid passage, as said magnetic force control unit.

32. (PREVIOUSLY PRESENTED) An apparatus for introducing a biological material according to claim 31, wherein said introduction treatment unit comprises: a magnetic source which can apply a magnetic force to the inside of said packing unit; and a magnetic force control unit which controls relative movement between said magnetic supports and said host by changing the relative position or the velocity between said packing unit or said mixture solution and said magnetic field, or the magnetic force itself due to said magnetic source.

33. (PREVIOUSLY PRESENTED) An apparatus for introducing a biological material according to claim 31, wherein said perforation treatment unit has: a perforation force source which can apply a perforation force by an electric field, or ultrasound, or the like; and a perforation force source control unit which controls said perforation force source.

34. (PREVIOUSLY PRESENTED) An apparatus for introducing a biological material according to claim 31, wherein said perforation force source control unit controls the perforation force source based on the properties, the amount, or the density of said host, said biological material, or said magnetic support.

35. (PREVIOUSLY PRESENTED) An apparatus for introducing a biological material according to claim 31, wherein said perforation force source control unit or said magnetic force control unit control the introduction treatment and the perforation treatment so as to be executed in spatial or time association with each other.

36. (PREVIOUSLY PRESENTED) An apparatus for introducing a biological material according to claim 31, wherein said packing unit has a liquid passage through which said mixture solution can pass, and has a pressure adjuster which draws and discharges the solution by adjusting the pressure in said liquid passage, as said magnetic force control unit.

41. (PREVIOUSLY PRESENTED) An apparatus for introducing a biological material according to claim 1, which further comprises: a transfer device which separates and transfers a solution containing a host which has been treated by said introduction treatment unit, and has said magnetic support adhered thereto or entered therein, or a host having the magnetic support adhered thereto or entered therein; a container containing a medium; and a separation unit for separating said magnetic support contained in said container and the host having said magnetic support adhered thereto or entered therein.